AMENDMENTS TO THE CLAIMS:

Please cancel claims 32, 35 and 38 without prejudice or disclaimer.

1. (Currently amended) A data storage element, comprising:

a substrate comprising a semiconductor material;

a metal oxide layer comprising an electrically insulating rare earth metal o isposed upon a surface of said substrate, said metal oxide layer comprising a predetermin ent-voltage profile for an applied voltage and forming an active element of said data s element;

a conductive material disposed upon said metal oxide layer;

a first electrode electrically connected to said conductive material; and

a second electrode connected to said substrate, to form said data storage e t.

2. (Original) The data storage element as set forth in Claim 1, wherein said oxide comprises lanthanum oxide.

3. (Original) The data storage element as set forth in Claim 1, wherein said oxide comprises a mixture of lanthanum oxide and aluminum oxide.

4. (Original) The data storage element as set forth in Claim 3, wherein said ctive material comprises metallic aluminum.

5. (Currently amended) The data storage element as set forth in Claim 1, w said metal oxide comprises at least one of:

~~1)~~ lanthanum oxide, and

~~2)~~ a mixture of lanthanum oxide and aluminum oxide, and said conducti erial comprising metallic aluminum.

6. (Currently amended) The data storage element as set forth in Claim 1, w said metal oxide layer has a thickness in a range of 10 Angstroms to [-] 10,000 Angstroms

7. (Currently amended) The data storage element as set forth in Claim 6, whe id metal oxide layer has a thickness in a range of 50 Angstroms to [-] 500 Angstroms.

8. (Original) The data storage element according to claim 1, wherein said co ve material comprises polysilicon.

9. (Original) The data storage element according to claim 1, wherein said co ve material comprises Aluminum.

10. (Currently amended) A data storage element, comprising:

a substrate comprising a semiconductor material having a source region a ain region formed in a surface of said substrate;

a layer of metal oxide disposed upon said surface of said substrate and be said source region and said drain region, said metal oxide comprising at least one met ch has a plurality of oxidation states, said metal oxide layer comprising a predetermined c ance-voltage profile for an applied voltage and forming an active element of said data e element;

a conductive layer disposed upon said layer of metal oxide;

a first electrode electrically connected to said conductive layer;

a second electrode connected to said source region; and

a third electrode connected to said drain region, to form said data storage nt.

11. (Original) A data storage element as set forth in Claim 10, said semicond material being n-doped silicon, said metal oxide comprising at least one of lanthanum oxi a mixture of lanthanum oxide and aluminum oxide, and said conductive layer comprising c aluminum.

12. (Original) The data storage element as set forth in Claim 10, wherein sai conductor material comprises n-doped silicon.

13. (Original) The data storage element as set forth in Claim 10, wherein said [redacted]oxide comprises at least one of lanthanum oxide, and a mixture of lanthanum oxide and [redacted]num oxide.

14. (Original) The data storage element as set forth in Claim 10, wherein said [redacted]ctive layer comprises metallic aluminum.

15-23. (Canceled)

24. (Currently amended) A memory, comprising:

a rare-earth based memory element for storing data based on hysteresis an[redacted]ent-voltage characteristics thereof, said rare-earth based memory element comprising

~~a metal oxide layer comprising an electrically insulating rare earth[redacted]oxide~~ disposed upon a surface of said substrate, said metal oxide layer comprising a pre[redacted]hined capacitance-voltage profile for an applied voltage and forming an active element [redacted] rare-earth based memory element.

25. (Currently amended) The memory as set forth in Claim 24, wherein said [redacted]y element comprises:

~~a substrate;~~

~~a metal oxide layer comprising an electrically insulating rare earth metal [redacted]disposed upon a surface of said substrate; and~~

a conductive material disposed upon said metal oxide layer.

26. (Original) The memory as set forth in Claim 25, wherein said metal oxide [redacted]prises lanthanum oxide.

27. (Original) The memory as set forth in Claim 25, wherein said metal oxide [redacted]prises a

mixture of lanthanum oxide and aluminum oxide.

28. (Original) The memory as set forth in Claim 27, wherein said conductive m[redacted]l comprises metallic aluminum.

29. (Currently amended) The memory as set forth in Claim 25, wherein said m[redacted]xide comprises at least one of:

~~1)~~ lanthanum oxide, and

~~2)~~ a mixture of lanthanum oxide and aluminum oxide, and said condu[redacted]material comprising metallic aluminum.

30. (Original) The memory as set forth in Claim 25, wherein said substrate co[redacted]es n-doped silicon, said metal oxide comprising at least one of lanthanum oxide and a[redacted]re of lanthanum oxide and aluminum oxide, and said conductive material comprising m[redacted]c aluminum.

31. (Currently amended) The data storage element of claim 1, wherein the me[redacted]ide layer ~~comprises an active element that~~ changes internally as a function of an applied v[redacted]

32. (Canceled)

33. (Previously presented) The data storage element of claim 1, wherein whe[redacted]ltage is applied between the first and second electrodes, beyond a threshold voltage, cha[redacted] accumulated in the metal oxide layer, thereby shifting current-voltage and capaci[redacted]voltage characteristics, and

wherein upon reversal of the applied voltage, beyond a second threshold [redacted]e, the charge in the metal oxide layer is discharged, thereby restoring original current-v[redacted] and capacitance-voltage requirements.

34. (Currently amended) The data storage element of claim 10, wherein the m ide layer ~~comprises an active element that~~ changes internally as a function of an applied vo

35. (Canceled)

36. (Previously presented) The data storage element of claim 10, wherein whe ltage is applied between the first and second electrodes, beyond a threshold voltage, char accumulated in the metal oxide layer, thereby shifting current-voltage and capaci voltage characteristics, and

wherein upon reversal of the applied voltage, beyond a second threshold v , the charge in the metal oxide layer is discharged, thereby restoring original current-v and capacitance-voltage requirements.

37. (Currently amended) The memory of claim 24, wherein said memory ele omprises a metal oxide layer on a substrate, and

wherein the metal oxide layer ~~comprises an active element that~~ changes i ly as a function of an applied voltage.

38. (Canceled)

39. (Previously presented) The memory of claim 24, wherein when a voltag lied to said memory, beyond a threshold voltage, charge is accumulated in the memory nt, thereby shifting current-voltage and capacitance-voltage characteristics, and

wherein upon reversal of the applied voltage, beyond a second threshold e, the charge in the memory is discharged, thereby restoring original current-voltage a acitance-voltage requirements.